Why Green and Golden Bell Frogs *Litoria aurea* should not be translocated — a personal opinion

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ABSTRACT

Species and populations are, and always have been, tied intimately to a geographical place. Much of what humans value in species/populations arises from their natural association with place. Translocation breaks forever the historical natural link between the organism and place. What then are we really "saving" when we translocate them?

DISCUSSION

One of the first thoughts that often comes to the mind of a property manager with a Green and Golden Bell Frog "problem" is "Why not just move them to some other place?" After all, there are many seemingly suitable habitats without frogs. And what could be an easier and more generally satisfactory solution for all concerned, including the frogs, than just moving them to a new location that is not as "inconvenient" as their present location?

Aside from the issue of whether those "vacant" locations really are suitable, and whether the translocation can be successfully achieved (Dodd and Seigel 1991; Reinert 1991), I believe there is another reason for not moving the frogs, or any other endangered species for that matter, to a new location except under the most extreme circumstances. This reason has to do with the importance of the geographical place which the species, or in practical terms, the local population, has occupied through natural means and events. Many of the reasons humans value organisms in the first place arise from this connection.

The evolutionary lineages, of which local populations are the currently evolving tips, have two important geographic components. The first, is the geographical pattern that those lineages have traced over the landscape through their own historical dispersal and, reciprocally, the pattern that the landscape has imposed upon the populations through geological (including climatic) events. Lineages spread out across the landscape in non-random ways following suitable habitat, and geological events can cause lineages to split and branch. These historical geographic effects act at all levels from continents down to subdivisions of local habitats such as the brickpit at Homebush Bay (Greer 1994; Pyke 1995), Sydney, and the ponds and lakes on the Kurnell Peninsula (pers. obs.) south of Sydney. Frogs themselves evolved at one spot on the globe and then spread to other parts of the earth, and a few Green and Golden Bell Frogs entering a new habitat such as a recently formed wetland spreads throughout that habitat in a non-random pattern. The historical relationship between evolving populations and geography can be inferred through detailed study of morphology, genetics, and earth history.

The second important geographic component of local populations is genetic adaptation to local conditions. A particular enzyme modification such as revealed in the electrophoretic analysis of Green and Golden Bell Frogs to date (Colgan 1996), a particular colour pattern, or a specific nuance of the male advertisement call may be adaptive in a local context. This is not only potentially important to the local population but also important to those people who are interested in evolution at the local or population level.

But Green and Golden Bell Frogs are probably good at finding and exploiting new places all on their own. What is so different, therefore, between that and people giving them just a "little bit of help"? The difference is that in the first instance it is the frogs themselves that are "making the decision" and living with the evolutionary consequences — as has always been the case. But in the second instance, it is people who are making the decisions, both conscious and unconscious, about which frogs, and therefore which genes, will be relocated into which place. The biological outcomes from the two methods of relocation are likely to be vastly different.

Translocation of populations breaks the connection between the organism and place. Furthermore, unless there is a detailed and long-term record kept of the translocated populations, as more and more populations are translocated, we will lose track of which populations have been translocated and which are natural. And unless representative samples of the original and "in transit" populations are kept in permanent storage (frozen tissue), we lose all hope of ever knowing what part of a translocated population's biology is due to its pre-translocation evolutionary history, what part is due to its translocation experience (e.g., the severe artificial selection inherent in a captive breeding programme) and what part due to its post-translocation evolutionary experience. At this stage, there is no evidence that there is the will or the resources to support these kinds of locality and specimen data bases on the scale required in perpetuity.

Translocation is a conservation technique of last resort, to be considered only to save a species or a significant population from extinction. It is more useful than taking the species or population completely into captivity, but it is only one step away. It preserves the organism, but not its geographical context. It launches the population onto a new evolutionary path, but without a record of what its previous path has been. For those to whom the concept of an organism is inseparable from its place, translocation is, in effect, a kind of extinction.

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